



**Presented by  
Scott Schramm  
Government Applications Manager**



## **COMBATT Program Overview:**

- **The COMmercially BAsed Tactical Truck (COMBATT) program is a collaborative venture between the U.S. Army National Automotive Center (NAC) and U.S. automotive manufacturers. The goal is to provide Army vehicles that have:**
  - **Enhanced Off-Road Mobility**
  - **Better Durability in a Military Environment**
  - **State-of-the-Art Technologies**
  - **Reduced Acquisition and Ownership Costs**
- **The COMBATT vehicle is a commercial light tactical truck manufactured to Army specifications. The NAC is working with U.S. automotive manufacturers to explore the use of modified commercial vehicles for carrying troops and cargo.**

## **COMBATT Key Benefits:**

- **Effective field support of tracked or wheeled vehicles.**
- **Leverages commercial technology to fulfill military mission needs.**
- **Takes advantage of high volume commercial production manufacturing assembly technologies.**
- **Reduces overall design and development costs.**
- **Provides for continuous upgrade via automotive technology evolution at reduced cost to the Army.**

## **COMBATT Nonmilitary SORV Derivative:**

### ● **Severe Off-Road Vehicle (SORV) for:**

- **Law Enforcement/Security**
- **Fire and Rescue**
- **Diplomatic Support (Embassies/Consulates)**
- **Military Base Logistics, Maintenance and Service**
- **State, County, Local and City Government Agencies**

### ● **Configured for Missions Including:**

- **Command, Control and Communications**
- **Shelter Carrier**
- **MedEvac Vehicle**
- **Light Cargo Transportation**
- **Personnel Transportation**



## Dodge Ram COMBATT Evolution:



Concept

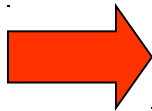
**COMBATT 1 1999 → 2000**



Tech Demo

**COMBATT 2 2001 → 2002**

**COMBATT 3 is the Next Step  
in the evolution of Chrysler  
Group's COMBATT Vehicle  
Program**



Demo

**COMBATT 3 2003 → 2005**

## **Dodge Ram COMBATT Timeline:**

- **1999 → 2000      Phase 1 Concept Vehicles**
- **2001 → 2002      Phase 2 Technology Demonstrator Vehicles**
- **2003 → 2005      Phase 3 Demonstrator Vehicles for In-Service Field Evaluations**
- **2004 → 2006      Phase 4 Pre-Volume (Series) Production Vehicles for Initial Army Unit Deployment**
- **2006              Phase 5 Volume (Series) Production Pending Congressional Funding**

## **Dodge Ram COMBATT 3 Demonstrator Features:**

- **5.9L High Output I-6 TurboDiesel Engine**
- **4 - Speed Automatic Transmission**
- **2 - Speed Heavy Duty Transfer Case**
- **Optional Integrated Starter/Generator Hybrid Electric Vehicle**

**System w/ 5 kW (or More) Auxiliary Power Generation Capability**

- **Provides 120 & 240VAC Electric Power at 60 Hz**
- **Includes: Silent Power Interior and Exterior Power**

**Outlets**

**COMBATT - Specific**

- **10,100 lb Gross Vehicle Weight Rating**
- **22,000 lb Trailer Tow/Gross Combined Weight Rating**

- **12/24 VDC Dual Voltage Alternator**
- **Superior Off-Road Capability enabled by an Extreme Mobility**

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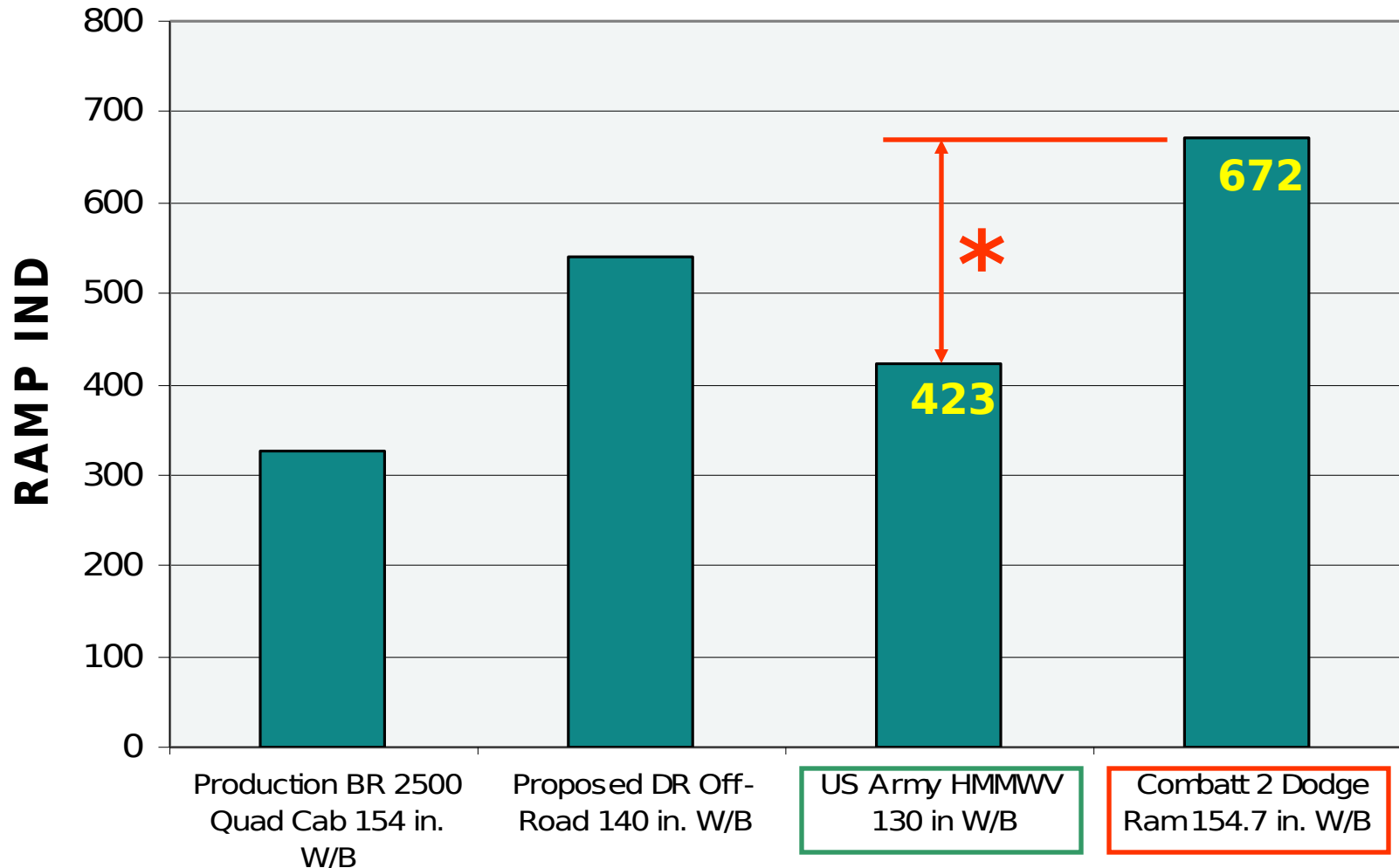


## **Dodge Ram COMBATT Hydro-Pneumatic Suspension**



**NOTE: Other Three Tires Remain in Ground Contact**

## Dodge Ram COMBATT hydro-Pneumatic Suspension



**\* NOTE: Ramp Index Coefficient Strongly Correlates w/ Off-Road Performance**



# DAIMLERCHRYSLER

*Chrysler Group Hybrid Electric Vehicles  
and Government Applications Team*

## **Dodge Ram COMBATT Hydro-Pneumatic Suspension**



**NOTE: Please See Video Tape at COMBATT 2 Hybrid Display**

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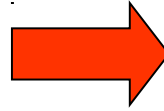
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## Dodge Ram Hybrid Functional Relationships:



**Contractor Special 1**



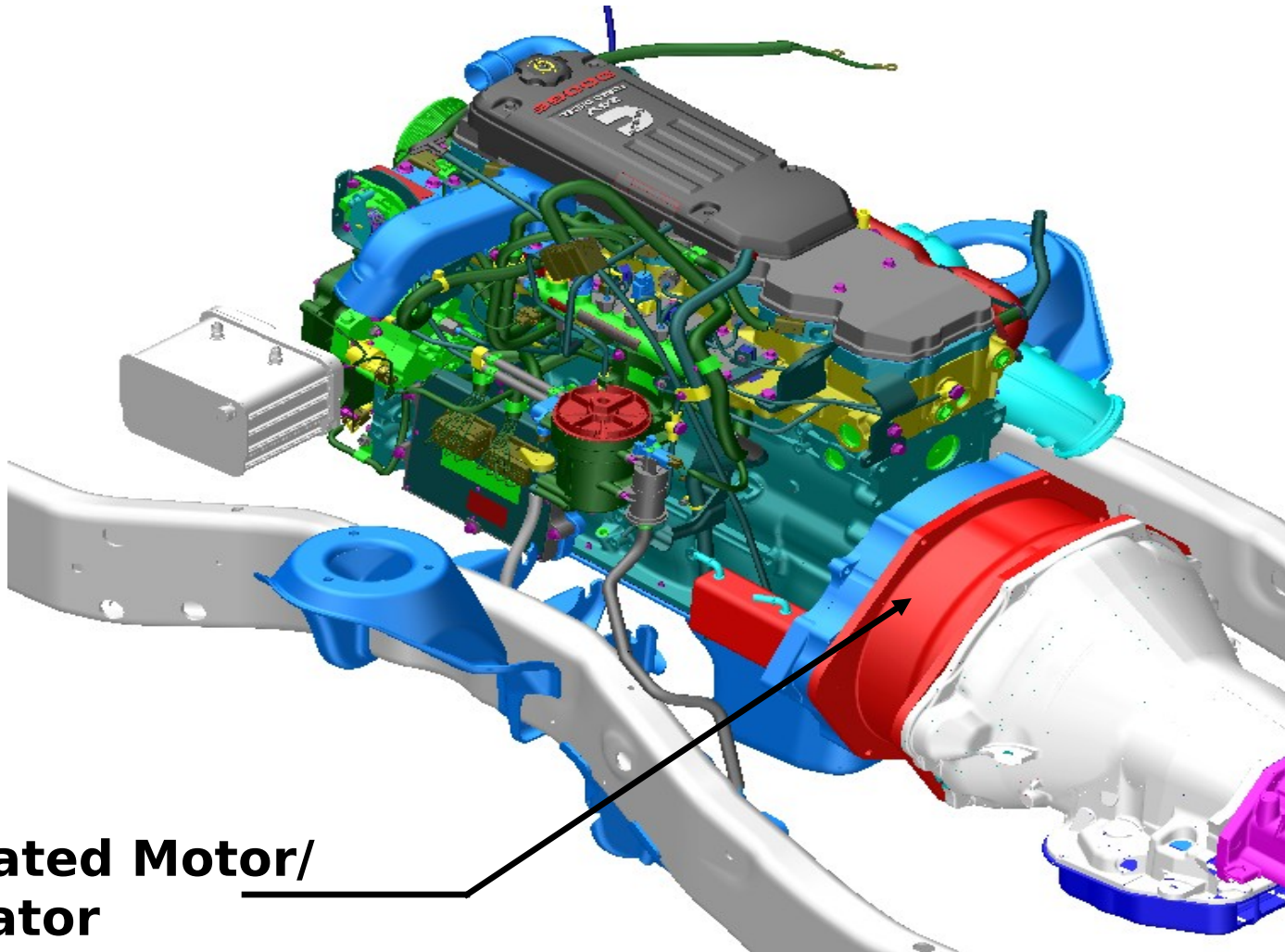
**SORV**



**COMBATT 3 Hybrid Demonstrator**

**Increasing  
Content &  
Functionality**

## **Dodge Ram COMBATT Hybrid Powertrain:**



**Integrated Motor/  
Generator**



## **Dodge Ram COMBATT 2 Hybrid Power Panel:**



**Location: Cargo Box Outer Wall**

## **Dodge Ram COMBATT 3 Hybrid Power Panel (Proposed)**



**Location: Cargo Box Inner Wall**

## **Dodge Ram COMBATT 3 Hybrid Logistics Advantage**

### ● Cruising Range (Miles):

- HMMWV*	275
- Dodge Ram COMBATT Hybrid	600 (est.)

### ● Silent Power (kW-Hrs)

- HMMWV	0
- Dodge Ram COMBATT Hybrid	1 → 1.5

### ● Engine Torque (Lbs-Ft)

- HMMWV	290
- Dodge Ram COMBATT Hybrid	555

### ● Engine Power (Hp)

- HMMWV	160
- Dodge Ram COMBATT Hybrid	305

**\* M1097A2 Cargo/Troop/Shelter Carrier**

## **Dodge Ram COMBATT 3 Hybrid Logistics Advantages**

- **Towed Load Maximum Weight (Lbs)**
  - HMMWV\* **4,200**
  - Dodge Ram COMBATT Hybrid **15,500**
- **Cargo Box Volume (Ft<sup>3</sup>)**
  - HMMWV **≤ 56.4**
  - Dodge Ram COMBATT Hybrid
    - 6.5 foot box w/ Quad Cab **57.7**
    - 8.0 foot box w/ Standard Cab **73.9**
- **Crew Capacity**
  - HMMWV **2**
  - Dodge Ram COMBATT Hybrid
    - Quad Cab **5**
    - Standard Cab **3**

**\* M1097A2 Cargo/Troop/Shelter Carrier**

## Dodge Ram COMBATT 3 Hybrid Logistics Impact:

Equipment Length	Weight (ft)	Length (ft)	Combined (lbs)
M1097A2 HMMWV	15.9		5,900
PU-797 5 kW Generator Trailer		12.3	
2,320 <b>\$20,000/Unit</b>			
M1097A2 + PU-797	-	28.2	8,220
Dodge Ram COMBATT 3 HEV	19.0	19.0	7,865



**COMBATT 3**

**Shorter by**

**Lighter by**

## Dodge Ram COMBATT 3 Hybrid Logistics Impact (Con

**C - 130J      Cargo Bay Length = 41.0 ft**

## - Accommodates:

- **1 M1097A2 + 1 PU-797 = 5 kW mobile power**
- **2 Ram COMBATT 3 HEVs  $\geq$  10 kW mobile power**

**C - 130J 30 Cargo Bay Length = 56.0 ft**

## - Accommodates:

- **2 M1097A2s + 1 PU-797 = 5 kW mobile power**
- **2 Ram COMBATT 3 HEVs + PU-797 ≥ 15 kW mobile power**



## Logistics Reduction Opportunity:



**Replacing the M1097A2 HMMWV + APU with a Dodge Ram  
COMBATT Hybrid w/ Powertrain Integral Motor/Generator**

- Significantly Reduces Acquisition Cost ( $\Delta \geq \$30K \rightarrow \$3$ )
- Enhances Reliability (One On-Board Engine)
- Reduces NVH, Heat Load & IR Signature (Battery Silen
- Recovers 72ft<sup>3</sup> of Shelter Volume
- Recovers 450 - 750 lbs of Payload

## **Dodge Ram COMBATT Hybrid Logistics Implication Summary:**

- **Reduced Total Life Cycle Costs:**
  - **Acquisition**
  - **Operation, Maintenance and Serviceability**
- **Increased:**
  - **Crew Capacity**
  - **Cruising Range**
  - **Portable Electric Power Delivery (Engine & Silent)**
  - **Towed Load Capacity**
  - **Cargo Volume**
  - **Off-Road Mobility**
  - **Engine Power and Torque**
  - **Transportability**
    - **Deliver More Vehicles, More Portable Electric Power, and More Vehicle Load Capacity per Ca**

## **Dodge Ram COMBATT Hybrid Logistics Implication Summary (Cont.):**

- **Increased Durability, Quality and Reliability.**
- **Access Emerging State-of-the-Art Technologies**
  - **Product**
  - **Process**
    - **Agile, Digital, Flexible & Lean Manufacturing**
- **Leverage**
  - **Embedded Diagnostics/Prognostics Infrastructure**
  - **Corporate R&D Portfolios.**
  - **Leverage Existing Worldwide Maintenance & Service Infrastructure**
  - **Existing Parts Warehousing & Distribution Infrastructure**
  - **Competitive Marketplace**

## Conclusion:

***The Dodge Ram COMBATT Hybrid***

***is a***

***Major Logistics Reduction Enabler***

***for All U.S. Military Service Branches.***

**Thank You for Your Attention!!**